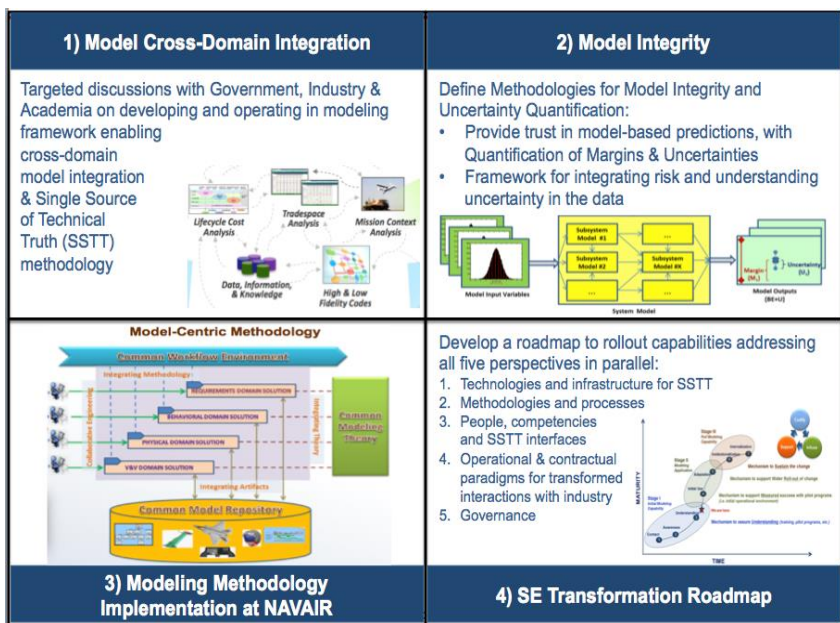


Overview of Research Task

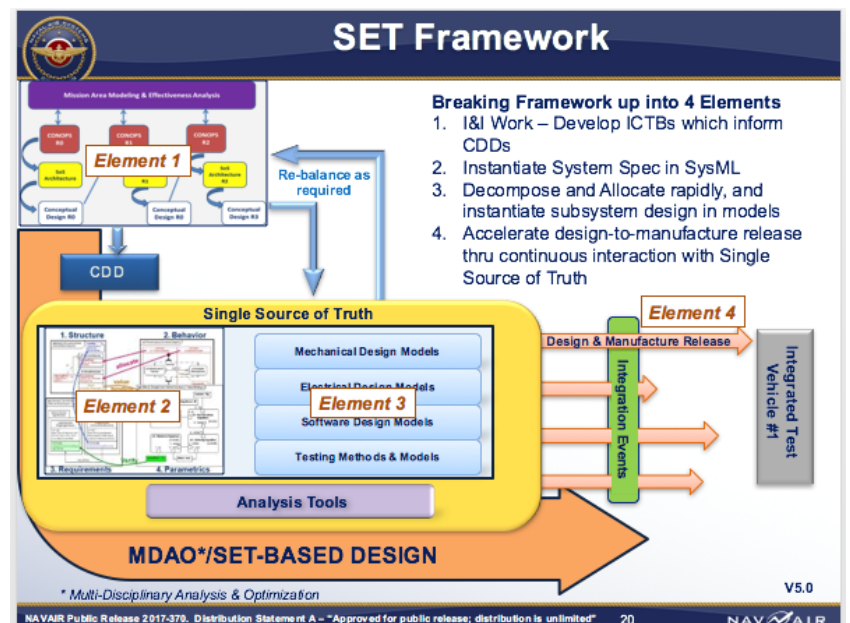
In 2013, Naval Air Systems Command (NAVAIR) initiated research to assess the technical feasibility of a radical transformation through a more holistic **model-centric engineering (MCE)** approach to enable mission-based analysis and engineering that reduces the typical time by at least **25%** for large-scale air vehicle systems. An understanding of the state-of-the-art was obtained through research tasks (RT-48, 118, 141). Prior to the start of RT-157, the research findings and gaps provided the basis for the efforts illustrated in the figure below. The current research task (RT 170) is an extension of RT 157.



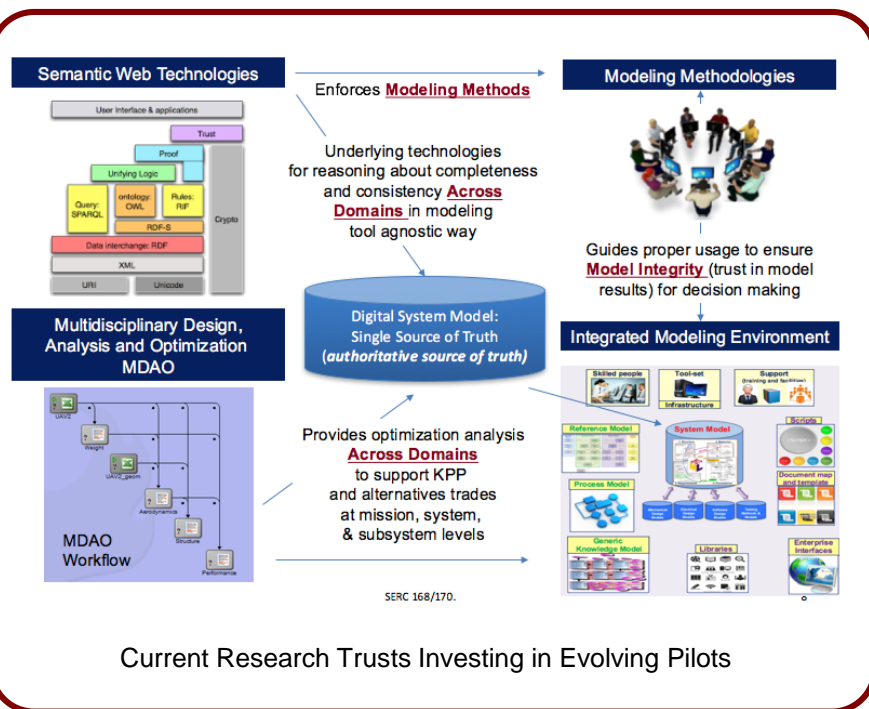
SE Transformation (SET) Framework

SET framework for a new operational paradigm for event-driven model-centric (“digital engineering”) approach.

- Elements 1 & 2 collaborative involvement between Government and Industry to assess mission and System of System (SoS) capability analyses
- Elements 3 & 4 industry leads process to satisfy conceptual model addressing the Key Performance Parameters, with focus on Performance, Availability, Affordability, and Airworthiness to create an Initial Balanced Optimized Design



Research Activities



Current Research Trusts Investing in Evolving Pilots

Executing the SET Framework using a Surrogate Pilot

Mission: Collaboration between Government and Industry in Model-based Acquisition under SET Framework

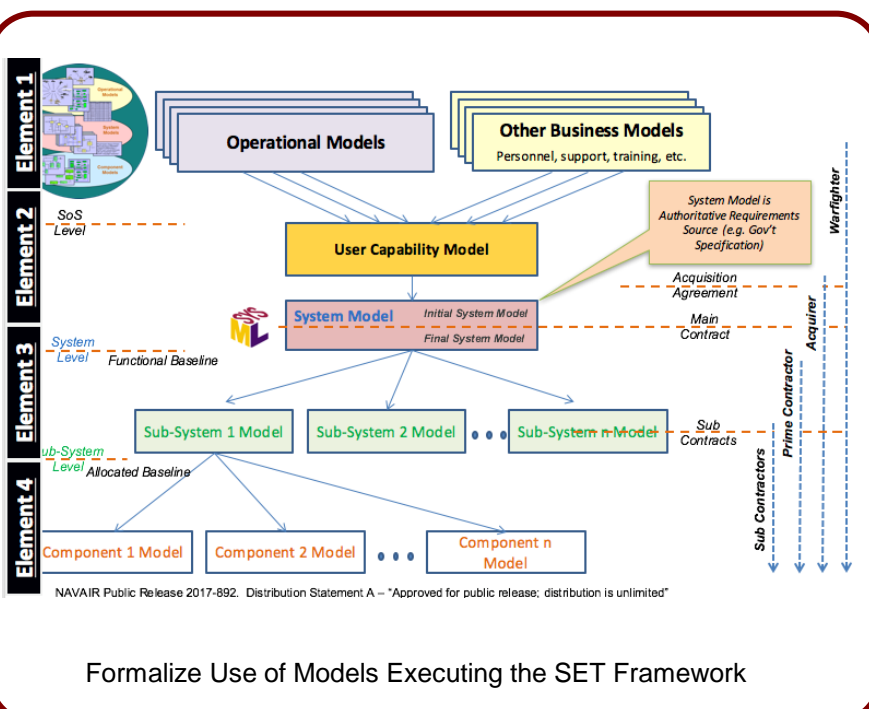
Goal: Execute SET Framework to Assess, Refine, and Understand a New Paradigm for Collaboration in Authoritative Source of Truth (AST)

Objectives (non exhaustive):

- Formalize experiment to answer questions about executing SET framework using Surrogate Contractor (SC)
- “Government team” creates mission, system (& other) models, “generates specification/RFP,” & provides acquisition models to SC as Government Furnished Information (GFI)
- SC refines GFI reflects corrections/innovations with physical allocation views with multi-physics-based Initial Balanced Design
- Simulate continuous virtual reviews and derive new objective measures for assessing maturing design in AST
- Demonstrate visualizations for real-time collaboration in AST
- Demonstrate and document methods applied
- Investigate challenging areas and research topics in series of pilots

Significant Events/Deliverables In FY17

- Modularization method for Authoritative Source of Truth in Surrogate Model
- Model method for mission-level aligned with Integrated Capability Framework
- Use of OpenMBEE Model Development Kity/DocGen demonstrated to “generate and specification”
- Evolving Initial System Model to go under “contract” for surrogate pilot*
- Develop evolving process model to characterize new operational paradigm used during pilot.
- Using NASA/JPL OpenMBEE for Integrated Modeling Environment to demonstrate State of the Possible*
- Surrogate Kick-off – Oct 2017*
- Develop parametrics using MDAO to support multi-physics constraints for pilot.
- Collaboration with ARDEC under RT-168
- Collaboration with Naval Postgraduate School under RT-176



Formalize Use of Models Executing the SET Framework

Contacts/References

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